Remarks/Arguments:

Claims 1-4, 6-11 and 14-26 are pending in this application. The Applicants thank the Examiner for consideration of previous arguments and amendments and for withdrawing the previous rejection in view thereof. The office action dated March 13, 2008 made the following rejections:

- Claims 1-4, 6-7, 9-11, 14-16, 18-23 and 25-26 were rejected under 35 USC 102(e) as anticipated by Ketchum (US 2003/0048856);
- Claims 8 and 17 were rejected under 35 USC 103(a) as obvious over Ketchum in view of Salvi (US 2004/139383); and
- Claim 24 was rejected under 35 USC 103(a) as obvious over Ketchum in view of Kim (US 2003/0128769).

The rejections rely upon Salvi only for the proposition of an interleaver of size N, and on Kim only for the proposition of a subpacket comprising only parity bits. In view of this limited reliance, these secondary references are not further detailed in these remarks.

As well summarized at its abstract, Ketchum details a MIMO transmission in which a common coding and modulation scheme are used to provide modulation symbols, which are then pre-weighted for each selected transmission channel based on the channel's characteristics. From all available MIMO channels, only the 'best' are selected for transmission while 'bad' channels are not used. Selection of these best channels is such that SNR for all of them are approximately similar, and so total available transmit power is distributed across these selected transmission channels. The SNR of these selected channels are matched to the coding and modulation scheme that is used for transmission.

From this summary and as will be further borne out below, the rejection is seen as improper in that Ketchum fails to disclose that there is a different rate for parallel transmissions from different transmitting antennas. To make this aspect unambiguous, independent claims 1, 21 and 22 are amended to recite that the second rate differs from the first rate, support for which is clearly seen at page 7 lines 16-28. The first and second rate element is added herein to

independent claim 11. The following remarks take claim 1 as representative of this rate-per-channel distinction over Ketchum.

Ketchum discloses at para 0027 that a known technique is to use a particular coding and modulation scheme that is selected per channel based on CSI, but that approach is explicitly not within the parameters of Ketchum's specific teachings. Para 0028 concludes with the statement that different code rate and modulation per channel entails excessive complexity to implement, leading logically into para 0028 which begins with the succinct statement that an aspect of Ketchum's invention is that data *for all selected transmission channels* is processed using *a common coding and modulation scheme* to provide the modulated symbols. That channel-specific coding is excluded from what Ketchum considers its invention is explicit at para 0029: "Moreover, the selective channel inversion technique may also provide improved performance over the channel-specific coding and modulation technique due to ...". As detailed below, the common coding aspect is a condition precedent to the entire operation of Ketchum's MIMO transmissions, and so to change this pre-condition is to undermine the entirety of Ketchum's principle of operation.

As the Applicants read Ketchum, the principle of operation is that throughput capacity is optimized by selecting only the 'best' channels for transmissions and not using the non-selected 'bad' channels for transmission (abstract, paras 0028, 0032, 0088 and Figure 2B block 266). Because these selected channels purposefully have similar SNR, this enables the available transmit power to be distributed across only those selected channels (para 0028, 0034, with para 0033 describing disadvantages of using all transmit channels as higher variation in symbol error probability and associated loss in bandwidth efficiency). Transmission channel inversion is one technique Ketchum details to find these SNR-matched good transmission channels (paras 0033-0066 and Figure 2A).

Note block 218 of Figure 2A where during the process of determining weighting factors to apply to the different transmission channels, the channel power gain is compared to a power gain threshold. Since these weights are applied to the transmit power used for the various

transmission channels, it is clear that the transmissions are to be at the same coding rate since a same coding rate is a condition by which they were each determined. Ketchum details at paras 0067- 0084 how an optimum threshold is selected, and unambiguously shows at 0075 that any particular n^{th} threshold that might be used for the weight calculation is associated with an n^{th} code rate. At Figure 2A, every single one of the transmission channels is evaluated at block 218 against the same rate-specific threshold, which was settled upon at block 214. The selection of Ketchum's channel weights therefore assumes a single code rate for the transmissions.

The same single-rate concept holds true at Figure 2B which describes how Ketchum selects the N_s channels that are to be used for transmission. Para 0033 explicitly states a common coding and modulation, and a single coder and code rate for encoding data for *all* transmission channels. Block 258 of Figure 2B clearly shows that a largest number *l* of best transmission channels is found that achieve the setpoint required *for the code rate* r_n. While block 250 provides for evaluating the available channels against different code rates by using different rate-specific setpoints, the output of the iterative loop in Figure 2B is a largest number *l* of transmission channels *for a single* n^{th} *rate*, which n^{th} rate is explicitly stated at supporting para 0087. The threshold, which is also specific to the nth code rate, is evaluated for the nth setpoint at block 260. This is how Ketchum selects a proper set of transmission channels. Without such a threshold, certain channels would demand too high a power to compensate for poor SNR (see para 0033 for disadvantages for channels with widely varying SNR), undermining Ketchum's goal of optimizing throughput. Using different rates defeats the purpose of SNR-matching the selected channels.

The examiner's citation to Table 1 and related text at paras 0103 and 0106 are seen to be misplaced. Table 1 does not show per-channel rate, but the different rates that are appropriate to the SNR ranges that are determined for the selected (or available) transmission channels. The examples at para 0103 bear this out in that each of the three different examples references only one coding rate to achieve the target of one information bit per modulated symbol. Though each example recites a coding rate different from the other examples, it is not a different coding rate for different antennas. These examples present as alternatives from which one may choose, given

a SNR range for the selected channels. Regardless of the choice, all selected transmit antennas will transmit using the single coding rate that is particular to that choice, and all non-selected transmit antennas will not be used.

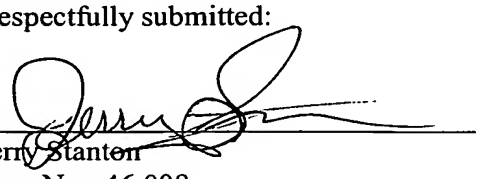
Ketchum clearly relies on a single coding rate for each parallel transmission from the different MIMO transmit antennas. Therefore claim 1 is not anticipated at least for its recitation of different first and second rates. All other independent claims similarly distinguish.

It is asserted and has been shown above that a single coding rate across all transmission channels is condition precedent to the entire Ketchum principle of operation. Therefore no prior art of record is seen to make it obvious to change Ketchum to a per-channel coding regimen. Such an adaptation would require such a fundamental and extensive rework of the Ketchum approach as to be well beyond ordinary skill.

As an additional matter, the office action at page 3 appears to assert that a single antenna embodiment of Ketchum anticipates claim 1. This is seen to be improper on its face. While the terms of claim 1 provide that either number N_1 or N_2 (representing numbers of systematic bits) may be zero, claim 1 also specifies that the size of the packets M_1 and M_2 are non-zero. An example is that one of the packets M_1 and M_2 has only parity bits and no systematic bits and the other has all N of the systematic bits (e.g., claim 3). The comments at page 3 in the rejection of claim 1 appear to rely on either M_1 or M_2 being zero, which claim 1 excludes. Claim 1 further recites transmitting in parallel from the first and second antennas, and so to read this claim as anticipated/obvious in view of a single antenna embodiment is seen to improperly read out the parallel transmission element of the claim. Relatedly, claims 2-3 are clearly beyond Ketchum regardless of the above argument respecting claim 1, because Ketchum has no transmission in which no information bits are sent (claim 3, N_2 systematic bits=0) and makes no distinction as to which stream might carry more or less of the N systematic bits (claim 2, maximize N_1). The rejection of these claims is seen to follow the mis-interpretation of Table 1 and related text, as detailed above.

The Applicants thank the Examiner for the additional search and detailed remarks, and now request that the rejections stated in the March 2008 office action be withdrawn and that claims 1-4, 6-11 and 14-28 be finally passed to issue. The undersigned representative welcomes the opportunity to resolve any matters that may remain, formal or otherwise, via teleconference at the Examiner's discretion.

Respectfully submitted:



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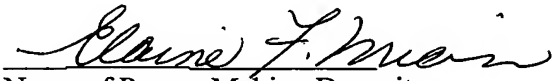

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